



# ***Leveraging a Flexible, Multidimensional Framework for Navy Force Planning & Policy Analysis***

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**Navy Workforce  
Conference, 2007**



## ***SKIPPER-III***

- **Developed out of an NPRST R&D effort under EMPIPS**
- **Proven Utility in Enlisted Plans & Policy Branch**
- **Easy to Use Interface**
  - New visual and cognitive techniques facilitate usage and understanding
  - “Open Box” Model
- **Web-based**
- **Integrated, Expandable Modeling Framework**
  - Multi-year Inventory Projection (Operational)
  - EMF-based historical data can be overridden by ECMs
  - Recruit/A-School Optimization and Conversion Planning (Operational)
  - ALNAV LOS Force Strength Planning Support Capabilities (Operational)
  - Advancement and Rotation Models (in R&D)
- **Straightforward Development Path to Explore ACDU Enlisted C-School Planning, ACDU Officer Planning and Reserve Planning**

# ***Enlisted Manpower and Personnel Integrated Planning System (EMPIPS)***

- **An NPRST R&D effort**
  - ONR funded
- **Develop Prototype Models and a Portal for Work Process, Data and Tool Integration for use by Enlisted Personnel Planning Managers**
  - Development of Tools
  - Integration of Decision Support Systems
  - Integration of Data and Information
  - Web enabled



# EMPIPS Portal & Force Health Monitor Vision

### SAP Portals Enterprise Portal 5.0 - Microsoft Internet Explorer

Address: http://empips2.dyncorp.com/sapportal

#### Force Health Monitor

My Wel

	DC	EMSW	EN	GS	GSE	GSM	HT	ICSW	MM
Strength	Green	Yellow	Yellow	Green	Green	Green	Green	Yellow	Yellow
Reenlistments	Yellow	Green	Green	Green	Green	Green	Green	Yellow	Yellow
PG Dist	Yellow	Red	Green	Yellow	Yellow	Yellow	Yellow	Green	Green
Sea-Shore Dist	Yellow	Yellow	Red	Green	Red	Green	Green	Yellow	Yellow
LOS Dist	Red	Red	Yellow	Green	Red	Yellow	Red	Red	Yellow

#### Model Data Integrator

Search Criteria: Skill Code: ALNAV, Datalog: All, Data Origin: All

Available Data: PG, LOS, Rotation, Gender, SRBZon

#### Tool Launcher

- Policy Formulation
  - Recruiting
    - SKIPPER-III
- Reports
  - Billet Structure
    - Web Target

### SKIPPER Data Driven - Microsoft Internet Explorer

Address: http://empips.dyncorp.com/skipperii/datadriven.asp

Skill: MMSW (B130), Skill Level: EMC, Scenario: MM FY04, Model: Rotation, School Plan: MM FY04 Accession Plan, Data: Total Non-School Gains

PG	Historic Inv.					Inventory Projections				
LOS	FY02	9/02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10
1 - 6	3,813	3,813	3,719	3,558	3,497	3,477	3,433	3,470	3,597	3,710
7 - 10	901	901	1,005	1,131	1,177	1,237	1,293	1,291	1,280	1,244
11 - 14	628	628	556	550	530	555	610	681	715	751
Other	2,568	2,568	2,361	2,113	1,897	1,633	1,433	1,249	1,117	1,062
B3	1,148	1,148	785	740	600	648	660	660	720	749
E4	2,613	2,613	2,787	2,666	2,543	2,434	2,390	2,260	2,219	2,247
E5	1,500	1,500	1,542	1,485	1,476	1,426	1,409	1,410	1,409	1,409
E6	1,530	1,530	1,484	1,443	1,463	1,403	1,382	1,382	1,382	1,382
E7	812	812	770	751	748	730	723	723	723	723
E8	187	187	164	162	166	162	160	160	160	160
E9	120	120	109	105	105	99	97	96	96	97
Total	7,910	7,910	7,641	7,352	7,101	6,902	6,769	6,691	6,709	6,767
EPA	8,008	8,008	7,642	7,354	7,318	6,928	6,771	6,771	6,771	6,771
INV/EPA	98.7	98.7	99.9	99.9	97	99.6	99.9	98.8	99	99.9
Losses	0	0	1,375	1,379	1,386	1,398	1,306	1,288	1,265	1,242
Gains	1,510	1,510	1,106	1,091	1,134	1,200	1,172	1,210	1,284	1,299

Overrides: Skill, Data, Name, 03 04 05 06 07 08 09 10

### Health Measure History

MM Health Measure: Reenlistments

Explanation: Ratio health measures divide actual data by target data (here, Reenlistments / ReenlistmentTargets). A score of 1.0 is perfect.

Color key: Red Problem, Yellow Warning, Green Satisfactory

Show actual and target data: Reenlistments / ReenlistmentTargets for [Sep FY01]

Recommended actions

### Reenlistments Ratio Health Measure Data

MM Reenlistments Compared To ReenlistmentTargets

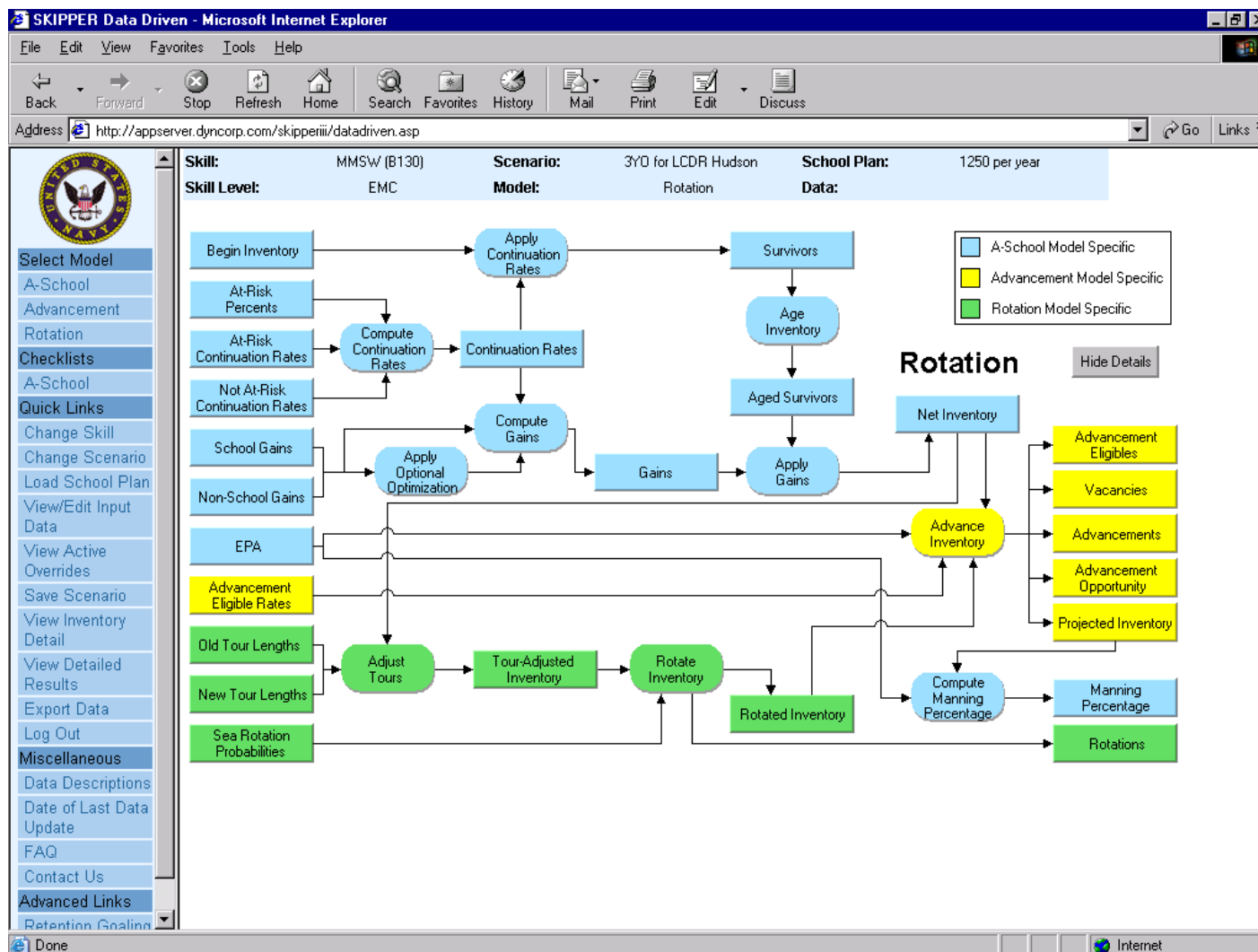
Explanation: This graph compares Reenlistments to ReenlistmentTargets over time.

Health status color key: Red Problem, Yellow Warning, Green Satisfactory

Health measure history

Recommended actions

# Accession, Advancement and Sea/Shore Rotation Model Processes



# Projected Inventory Results

**SKIPPER Data Driven - Microsoft Internet Explorer**

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- FAQ
- Contact Us
- Advanced Links
- Retention Goaling

**Skill:** MMSW (B130) **Scenario:** MM FY04 **School Plan:** MM FY04 Accession Plan

**Skill Level:** EMC **Model:** Rotation **Data:** Total Non-School Gains

PG	Historic Inv.		Inventory Projections							
LOS	FY02	9/02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10
<b>1 - 6</b>	3,813	3,813	3,719	3,558	3,497	3,477	3,433	3,470	3,597	3,710
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<b>B3</b>	1,148	1,148	785	740	600	648	648	660	720	749
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<b>E6</b>	1,530	1,530	1,484	1,443	1,463	1,403	1,382	1,382	1,382	1,382
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<b>E8</b>	187	187	164	162	166	162	160	160	160	160
<b>E9</b>	120	120	109	105	105	99	97	96	96	97
<b>Total</b>	7,910	7,910	7,641	7,352	7,101	6,902	6,769	6,691	6,709	6,767
<b>EPA</b>	8,008	8,008	7,642	7,354	7,318	6,928	6,771	6,771	6,771	6,771
<b>INV/EPA</b>	98.7	98.7	99.9	99.9	97	99.6	99.9	98.8	99	99.9
<b>Losses</b>	0	0	1,375	1,379	1,386	1,398	1,306	1,288	1,265	1,242
<b>Gains</b>	1,510	1,510	1,106	1,091	1,134	1,200	1,172	1,210	1,284	1,299

**Overrides**

Skill	Data	Name	03	04	05	06	07	08	09	10

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# ***A-School Planning***

- **“What If” Capability**
  - EPA targets, school lengths and capacities, and personnel flow rates overrideable
  - Powerful scenario management
- **Descriptive Mode**
  - Projects inventories and manning % given School and Non-School gains
- **Prescriptive Mode**
  - Determines optimal number of A-School inputs to meet EPA target
    - Unconstrained
    - Constrained Options
      - Maximum School input %deviations
      - Freeze/minimum School inputs
      - Enforce A-School capacity limits
      - Never exceed EPA

# Entering Inputs

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**Skill:** MMSW (B130) **Scenario:** **School Plan:**

**Skill Level:** EMC **Model:** A-School **Data:** Total Non-School Gains

**School Plan**

Copy to Future FYs Optimize School Inputs Save School Plan Load a Different School Plan View Female Breakout

		FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10
<b>School</b>	4Y0 A-School	12	12	12	12	12	12	12	12	12
<b>Lengths</b>	6Y0 A-School	0	0	0	0	0	0	0	0	0
<b>Limit</b>	A-School									
<b>Attrition</b>	4Y0 A-School	0.1						0.1	0.1	0.1
	6Y0 A-School	0.1						0.1	0.1	0.1
4Y0	CNRC									
	Fleet Input									
	Jobs Input									
	College Fund									
	NTSP									
	Misc Input									
6Y0	Direct Input									
	Input to TASP									
<b>Gains</b>	Non-School	531	531	531	531	531	531	531	531	531
	A-School	979	0	0	0	0	0	0	0	0
	<b>Total</b>									
Updated	<b>Inventory</b>	7,911	6,535	5,346	4,373	3,574	3,003	2,510	2,109	1,797
	Target EPA (100%)	8,008	7,642	7,354	7,318	6,928	6,771	6,771	6,771	6,771
	Inv/Target EPA (%)									
	EPA	8,008	7,642	7,354	7,318	6,928	6,771	6,771	6,771	6,771
	Inventory/EPA (%)									

**User Coach**

4Y0: 6Y0:

A-School Limit: 2850

Last year's input (FY02): 730

Expected attrition rate: 0.04

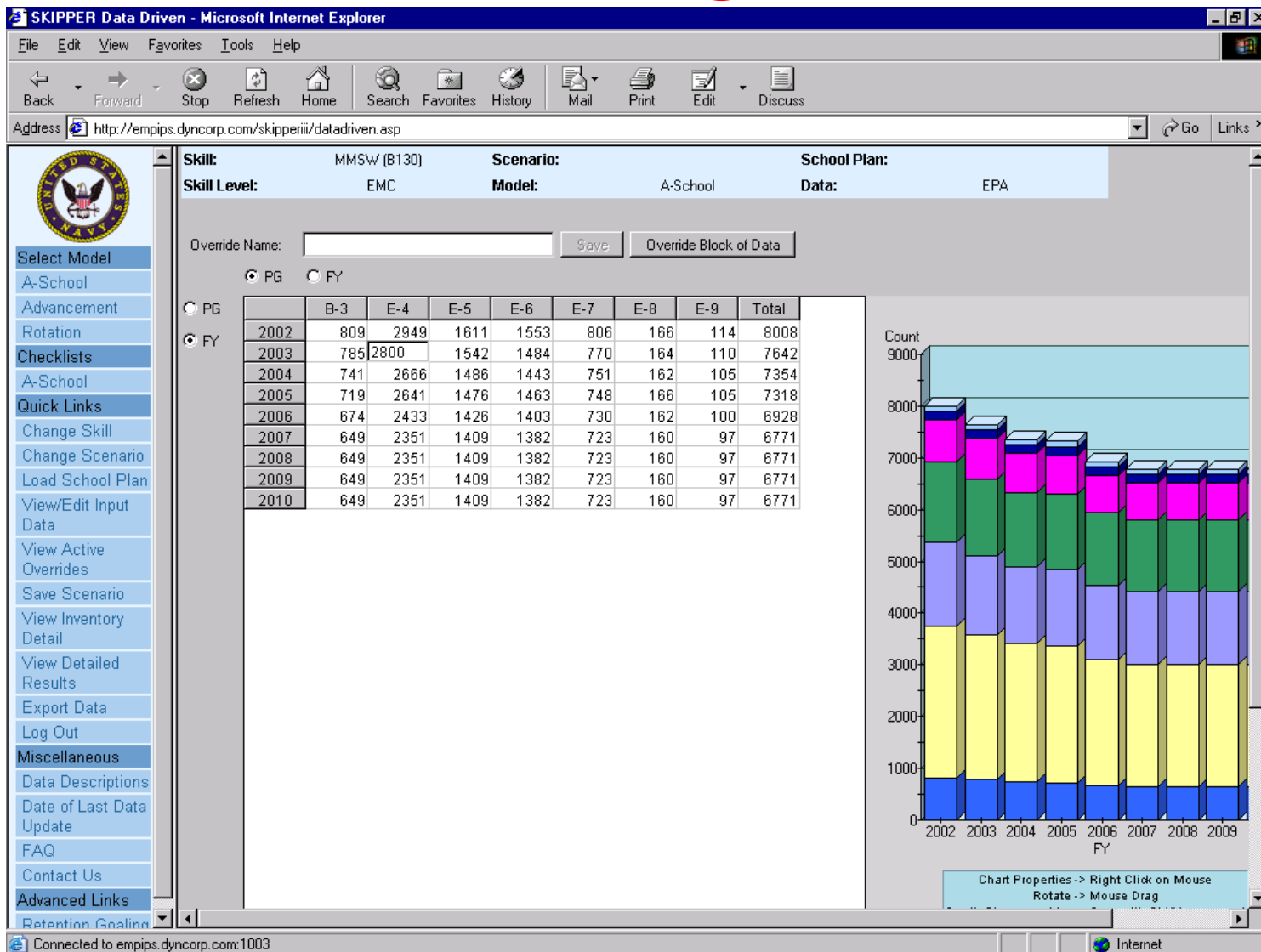
☐ Optimize School Inputs

OK Cancel Help

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# Overriding EPA



# Model Run

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**Skill:** MMSW (B130) **Scenario:** **School Plan:**

**Skill Level:** EMC **Model:** A-School **Data:** Total Non-School Gains

**School Plan**

Copy to Future FY's Optimize School Inputs Save School Plan Load a Different School Plan View Female Breakout

		FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10
<b>School Lengths</b>	4Y0 A-School	12	12	12	12	12	12	12	12	12
	6Y0 A-School	0	0	0	0	0	0	0	0	0
<b>Limit</b>	A-School	2,850	2,850	2,850	2,850	2,850	2,850	2,850	2,850	2,850
<b>Attrition</b>	4Y0 A-School	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
	6Y0 A-School	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
4Y0	CNRC	730	730	730	730	730	730	730	730	730
	Fleet Input									
	Jobs Input									
	College Fund									
	NTSP									
	Misc Input									
	Input to TASP									
6Y0	Direct Input									
	Input to TASP									
<b>Gains</b>	Non-School	531	531	531	531	531	531	531	531	531
	A-School	979	700	700	700	700	700	700	700	700
	<b>Total</b>	1,510	1,231	1,231	1,231	1,231	1,231	1,231	1,231	1,231
Updated	<b>Inventory</b>	7,910	7,657	7,397	7,125	6,843	6,665	6,514	6,408	6,348
	Target EPA (100%)	8,008	7,642	7,354	7,318	6,928	6,771	6,771	6,771	6,771
	Inv/Target EPA (%)	98.77	100.19	100.58	97.36	98.77	98.43	96.2	94.63	93.75
	EPA	8,008	7,642	7,354	7,318	6,928	6,771	6,771	6,771	6,771
	Inventory/EPA (%)	98.77	100.19	100.58	97.36	98.77	98.43	96.2	94.63	93.75

Done Internet

# Using Optimization

**Optimize School Inputs**

Select a pipeline for school input optimization.  
The unselected pipeline will be fixed.

☒ 4YD A-School  
☐ 6YD A-School

**Constraint Options**

**Direct School Input Constraint Options**

If your constraints are very restrictive, it is best to add a constraint for one FY, run optimization, and add the constraint for the next FY if all goes well.

☒ Enforce A-School Limit    ☒ Never exceed EPA

	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10
Freeze School Inputs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Minimum School Inputs	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Maximum Deviations	10.0 %	10.0 %	10.0 %	10.0 %	10.0 %	10.0 %	10.0 %	10.0 %
Fiscal Year Weights	1	0.33333	0.11111	0.03704	0.01235	0.00412	0.00137	0.00046

## Optimized Results - C-School Planning Model proof of concept

[illegible]

# Unconstrained Optimization Results - C-School Plan

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**Skill:** MN (C160) **Scenario:** MN-0410 C-School Plan POC **School Plan:** C-School Plan

**Skill Level:** EMC **Model:** A-School **Data:** Total Non-Scl

**C-School Plan**

[Copy to Future FYs](#)
[Optimize School Inputs](#)
[Save School Plan](#)
[Load a Different School Plan](#)
[View Female Breakout](#)
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		FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10
<b>Length (weeks)</b>	C-School	6	6	6	6	6	6	6	6	6
<b>Limit</b>	C-School	0	0	0	0	0	0	0	0	0
<b>Attrition</b>	C-School	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
<b>Input</b>	C-School	32	71	37	41	42	41	41	41	41
<b>Gains</b>	Reutilizations	5	5	5	5	5	5	5	5	5
	C-School	32	65	40	40	41	40	40	40	40
	<b>Total</b>	37	70	45	45	46	45	45	45	45

		FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10
Updated	<b>Strength</b>	68	101	101	102	101	101	101	101	101
	Target EPA (100%)	100	103	103	103	103	103	103	103	103
	<b>Str / Target BA (%)</b>	68.0%	98.05%	98.05%	99.02%	98.05%	98.05%	98.05%	98.05%	98.05%
	<b>BA</b>	100	103	103	103	103	103	103	103	103
	<b>Strength / BA (%)</b>	68.0%	98.05%	98.05%	99.02%	98.05%	98.05%	98.05%	98.05%	98.05%

# Accession Modeling - ACDU vs. SELRES

<b>High Level Concepts ACDU</b>		<b>SELRES</b>
<b>EPA or Target</b>	<b>EMC x PG</b>	<b>Rating x PG</b>
<b>Begin Inventory</b>	<b>Skill x LOS x PG</b>	<b>Rating x PG x LOS/YQS</b>
<b>- Losses</b>	<b>At-Risk CR, Not-At Risk CR</b>	<b>Died, Retired, HYT, Discharged, ACDU, IRR (quit drilling, reg. transfer)</b>
<b>+ Gains</b>	<b>School, Non-School</b>	<b>ACDU, NPS, IRR, Lateral/Other</b>
<b>+/- Advancement*</b>	<b>Vacancy Driven Examined, Non-Examined</b>	<b>Vacancy Driven Examined, Non-Examined</b>
<b>Sea/Shore Rotation*</b>	<b>Rotation path probabilities (Sea to Shore, etc.) Tour lengths (PST and NST)</b>	<b>N/A</b>
<b>End Inventory</b>	<b>Skill x LOS x PG</b>	<b>Rating x PG x LOS/YQS</b>

*\*In Development*

# ***Sea-Shore Rotation Modeling***

- **Inputs**

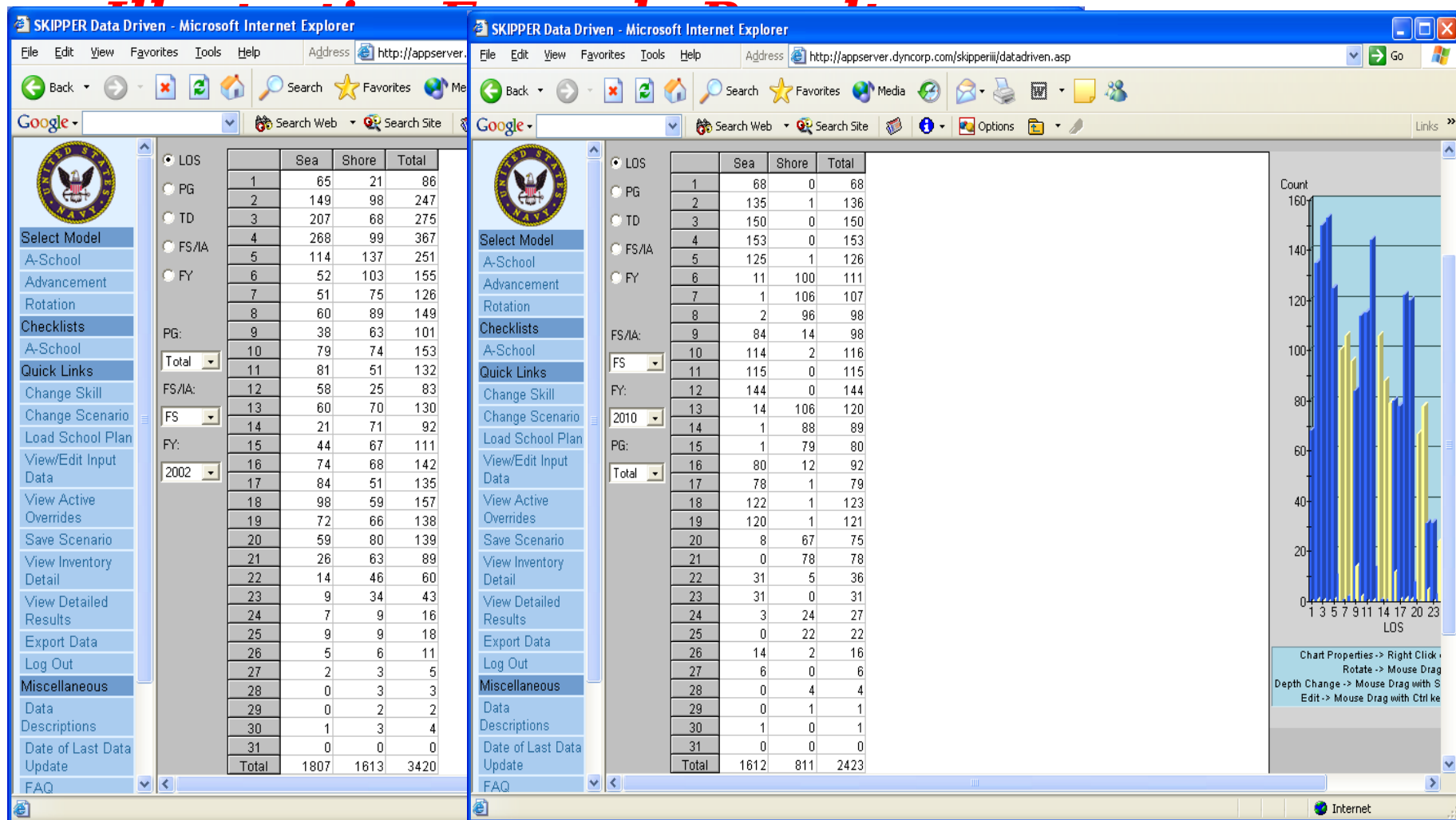
- Begin inventories with Time-to-PRD
- Tour lengths (PST and NST)
- Rotation path probabilities (Sea to Shore, etc.)
- Phase-in logic
- IA time between rotations, initial IA time and TPPH
- EPA, School/Non-School Gains, Continuation Rates, etc.

- **Outputs by EMC, Paygrade and LOS**

- Projected Inventories by Sea/Shore/IA
- Projected Rotations to Sea/Shore

- **Ready for 6.5 Transitioning**

# Begin and Projected Inventories (FY10) by S/S and LOS

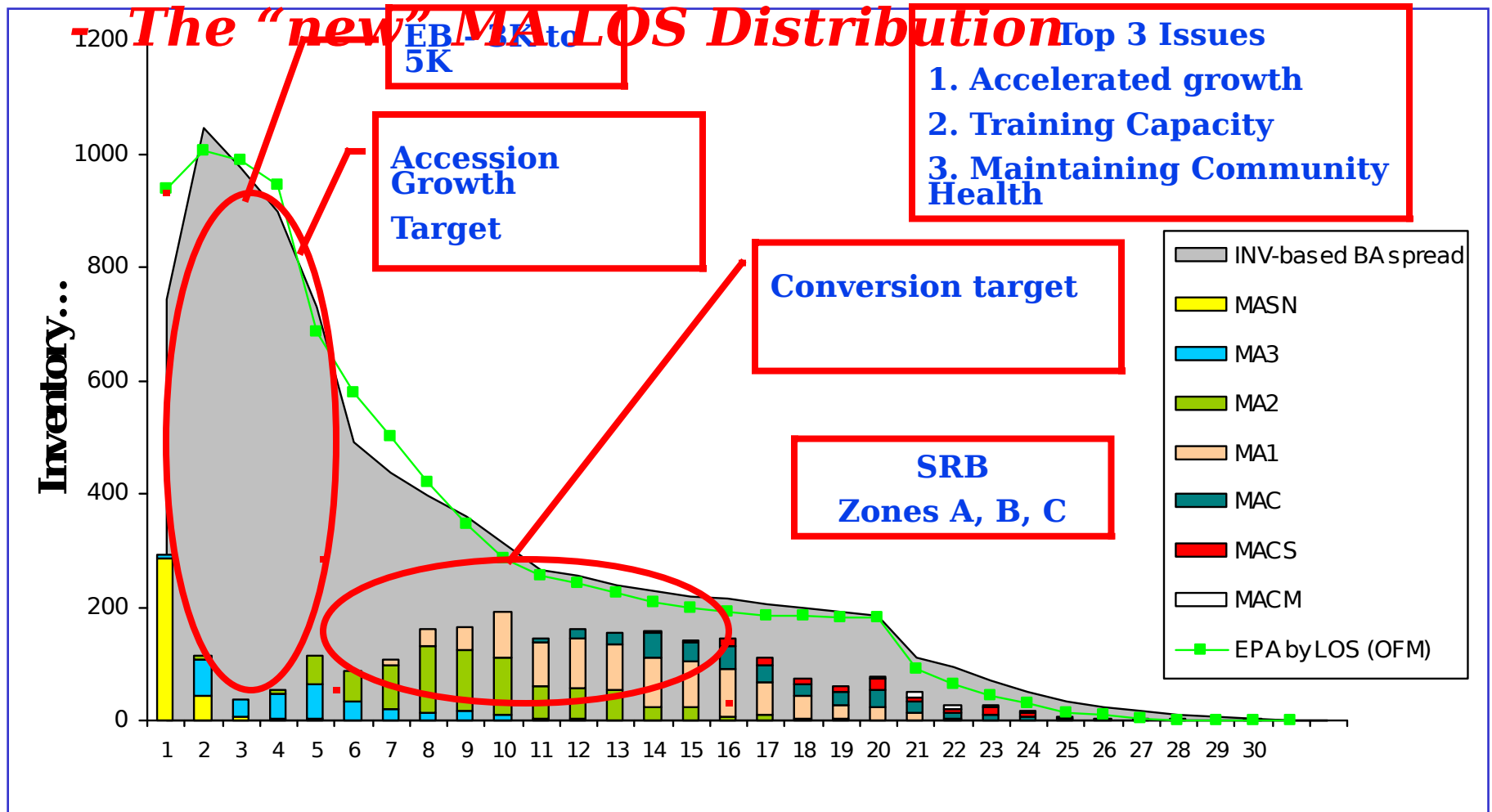




## ***SRB Justification and Decision Support***

- **Leverage existing N132 and NPRST econometric studies/results**
- **More cost effective SRB allocations in the context of projected reenlistment and manning ROI, SRB budgets, and training and distribution**
- **Proof of concept developed under N132 guidance**
- **Current Strength, Inventory and Manning by NEC and Source Rating**
- **Target BA by LOS**
- **Projected Reenlistments and Manning % for Proposed Multiples**
- **Summary/Rollup, Budget Reconciliation and Tracking Tool**

# Defining a target paygrade structure by LOS



## *Officer Modeling*

- **Utilize SKIPPER-III framework**
- **Within-year Officer Loss Forecasting (WOLF) utilizing some features of the N-Dimensional array modeling infrastructure**
- **Fully leverage SKIPPER-III in support of inventory management**
  - Accession Planning
  - Promotion Planning
  - Project Laterals

# Summary

- **Existing Enlisted Decision Support Tools**
  - All work done through NPRST under 6.2/6.3 R&D
  - Proven Utility in Enlisted Plans & Policy Branch
  - SKIPPER-III (EMC and ALNAV)
    - Integrated, Expandable Navy Personnel Modeling Framework
    - Provides means to Transition towards Goal
  - Objective Force Model (ALNAV) provides Steady State Goal Determination
- **Numerous Other Capabilities close to transitioning**
  - Proof of concepts / prototypes completed
  - Leverage proven Projection Technology to complete Sea/Shore, Advancement, SRB Justification & C-School Planning Tools and Rollup/Reconciliation T&E
  - Explore Force Transition Alternatives and Force Health Monitoring Trends
    - Recruiting vs. Retention, Force Size and Shape, Costs/ROI, etc.

# *Contact Information*

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# ***Backup Slides***